

Rover SD1 Twin Plenum Vitesse D330 ENH - Tales of Caution Number 4 - 2Q'94

The project to upgrade my Vitesse D330ENH continues with real progress at last! I located a good, used "Fast Idle Solenoid" p/n ERC 7536A, the item wired in parallel with the air-con compressor clutch which bleeds air from the metered air-rail to the plenum preventing the Air Conditioning knocking 200 revs off the idle speed. It cost a very reasonable £12 from "Rover-tune", Range Rover Breakers in Reading. Several R/R breakers were contacted. They were all helpful and informative and are logical additional sources for V8 injection parts. This, after the Rover partsman priced a new one at £43 and the Range rover partsman quoted £34 for the same item and quotes for used solenoids from members/traders who advertise regularly in "ROVER" came in at £25 and £20 respectively. It seems that our dealers are not the only folk out there seeking big profits.

Before I located it I was contemplating a solenoid lifted from a dead Lada but figured the technology which put Yuri Gagarin into space was too advanced for my Vitesse! During my search I also contacted the manufacturer, Tecalemit who were very helpful and identified it as their part but who unfortunately sell only to the trade. However when I tied a second time to persuade them to deal with me a very sympathetic store man sent me one as a free sample.

I have also solved the big-niggle of replacing my damaged air intake hoses for the Twin Plenum. I obtained "Rapduct" (*), a 3" bore, reinforced, corrugated, spiral-wound, rubberized-canvas hose; made some "cuffs" from an old motor cycle inner-tube and obtained wider hose clips than the dainty chrome set fitted by Rover. Four cuffs were cut about 1.5" wide, folded double and stretched onto the housings for the hose to bed onto. Two short hose lengths were prepared by cutting and extracting the spiral wires from each end, eased into place over the cuffs and hose clips firmly tightened into place. It's neat, durable and completely airtight! Hopefully, time will prove it to be as good as it looks.

Thus with the above spares available, I could commence removal of the plenum chamber allowing access to the faulty "Fast Idle Solenoid" and investigate the "Idle speed hang-up" problem caused by sticky throttle mechanisms. At the same time I would be removing some aluminum upper parts to be polished up on the bench and replace the thermostat because I had detected slow engine warm-up and variable water temperature (70 to 95 degrees) which, when fed back to the ECU, would cause increased fuel consumption at the lower temperature.

With the cooling system partially drained and all the water, air, petrol, vacuum and electrical connections to the plenum chamber disconnected (Yes! It's true! Five different services connected to one single component); removal of the chamber revealed the full extent of the "gummy" deposits delivered by the crankcase breather to the area surrounding the throttle discs. What a mess for the design team to feed directly onto the front throttle? Perhaps if they did it again they would filter the gum from gases somehow?

Even more waxy-goo was present behind the potentiometer and around the front spindle bearing. The idle speed adjuster screw and its O-ring were caked in crusty carbon deposit as was the idle-air channel leading into the chamber. The throttle mechanism, jackshaft, quadrant and associated brackets were cautiously dismantled and cleaned with particular care taken to protect the edges of the discs. There was minor wear in the rear spindle and on the rear disc but I would not be replacing them at the first pass.

Surprisingly, there were only 3 spindle seals present when the micro-fiche says there should be 4! These would need to be renewed, and guess what?? The lowest price came from the Range Rover partsman. The plenum interior including the various water/airways was thoroughly cleaned with solvent. The exterior was stained and oxidized so this was cleaned-up with saucepan cleaning paste/compound and polished with toothpaste. It's now shiny, tastes great and won't need any fillings until the next check-up! The rocker covers and other aluminum parts had the same treatment. To preserve the finish I rubbed Dow Corning clear silicon compound well into all the exterior surfaces, figuring that because nothing sticks to silicon, it should neither stain nor oxidize too quickly.

The throttle mechanisms were re-assembled as described in Rover's technical bulletin (No 182 dated 28/1/88) not replacing the quadrant as demanded, but ensuring it would fit tight again on its shaft by opening up the "slit" with a junior hacksaw and making sure the screw, nut and washers seated neatly into their locations. The throttle disc retaining screws were not tightened until last so that the best fit could be made in their final position to try and minimize any "hang- up" which would probably occur. The interconnecting adjusters were carefully positioned to ensure both discs opened simultaneously and the quadrant was set to open the discs as it moved away from its stop.

During this reassembly operation a couple of design deficiencies came to mind. For a start the two throttle central throttle return springs seem too strong and would be the prime cause of wear in the rear spindle and bearings. Second the whole mechanism could have been centre pull as depicted on the customized J.E. version on the front cover of March 94 "Rover". It's not as pretty but the original designers needed a compromise here. Note, I subsequently came to change my view on the advantage of centre pull which would not be necessary providing the TP throttles were correctly maintained).

During a thorough inspection and clean-up of parts, pipes and wiring exposed by the removal of the plenum and rocker covers I cracked one of the grey injector wiring plugs but not too badly. The lesson here is to warm them slightly with a hot air gun and spray them all with WD40 before easing them off. Re-assembly of the plenum parts was the reverse of removal (as they say in Haynes) with instant gasket used for the plenum seal but with one face coated with oil to facilitate easy removal next time around! I am pleased with the visual appeal of lightly polished aluminum and new air intake hoses but what would be the performance outcome of this major throttle/plenum interior clean-up?

With the throttle potentiometer set 40 milli-volts higher than before (0.360 volts is the upper limit according to "expert" advice), the mixture screw 3 turns out and the idle

screw somewhere similar to my the last setting, the engine started first poke. After warm-up it idled at about 1800 rpm! Not to worry! I found that with the idle screw wound down another 3 or so turns it gave a very responsive control over the idle speed. This certainly resulted from either cleaning up the gunged screw, O-ring and airway or from a small increase of air passing around the cleaned-up discs? It doesn't really matter though, as long as the air flow is constant! On the road I commenced a long experiment shuttling up and down the local A1 at Biggleswade, parking-up regularly to fine-adjust the throttle potentiometer setting, mixture and idle speed. I initially found that the engine seemed to choke at high speed so the throttle potentiometer and the mixture setting were reduced.

At the end of the trial the settings/results were:-

- Throttle pot 328 millivolts.
- Mixture screw 2 turns out.
- Idle speed 875 rpm.
- Plug colour Light straw.
- Performance Excellent.

And Bravo! The air-con no longer lowered the idle speed, which is rock steady as the refrigerator cycles on and off. There was still however a minor throttle hang-up.

Under normal driving the idle speed always resets to the same level but when stationary, if I lightly tapped the interconnecting mechanism with a screwdriver handle or pushed it with my fingers the throttle discs "bedded" a little bit more and the speed dropped a tad! This might be a disc set-up problem or it could be wear. Either way it was much improved and deserves time to settle in. I made a neat eccentric adjuster fitted over the throttle stop bar to improve quadrant adjustment and this should help prevent the "final retreat" of the discs. Failing that, the central springs can be differentially adjusted for tension and if that doesn't work the plenum may have to come off again for re-adjustment of the discs.

Shortly thereafter, starting with a warm engine, I monitored a smooth 65 mile test over country roads in light traffic followed by two 20 mile fixed speed tests on a main trunk road in moderate traffic with the following fuel consumption results:-

- Smooth country trip 65 miles @ 28.3 mpg average
- Fixed speed 70 mph 20 miles @ 30.1 mpg average
- Fixed speed 55 mph 20 miles @ 38.3 mpg average

The acceleration and high speed performance seem quite good but I needed a comparison and have since met up with fellow Vitesse owner/member Andrew Burge from Ipswich who had a below par twin plenum and was also seeking help. In atrocious weather, Andrew drove my car to the limit of the prevailing conditions and declared it to be in really good shape, performance-wise! I would be very keen to meet up with other fellow Twin Plenumites for similar information exchanges and collaboration.

I had a telephone call from Tim Warner, West Sussex, who told me that he has upgraded the performance of his version with big-bore exhausts, higher fuel pressure, changed Air-flow meter settings and modified Distributor and I found his experiences very informative indeed.

My goal, however, is to maintain the car as near to standard as possible (forgiving the stainless steel exhaust) and to optimize the original performance without resort to professional set-up charges as my budget won't stretch very far! Also, learning about the car is great fun and I am meeting some very helpful club members along the way.

Changing the subject, I recently experienced a tinny rattle below the gear lever which was also strangely loose! Removing parts from inside the car I discovered that the retaining cap had broken. The fixing lug had sheared and the cap was floating about. One good pull on the gear stick and it would have come right off in my hand. Repair was affected by welding the lug back on with a generous fillet and cleaning up with a burr, but I am on the look-out for a replacement if anybody out there has a spare one?

(* "Rapduct" Hose 3in bore @ £10.15/metre + Vat + Carriage from R.A.P Industrial Distributions Ltd Doctors Piece, Willenhall, W/Midlands, WV13 1PZ Tel 01902 631123)

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